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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,235	08/20/2003	Douglas M. Gill	100.2483	6473
27997 7590 05/31/2007 PRIEST & GOLDSTEIN PLLC 5015 SOUTHPARK DRIVE SUITE 230 DURHAM, NC 27713-7736			EXAMINER CURS, NATHAN M	
			ART UNIT 2613	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/644,235

Applicant(s)

GILL ET AL.

Examiner

Nathan Curs

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 March 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3-9, 13, 15, 17-21 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi (US Patent No. 4878726) in view of Mizuhara (US Patent No. 6535316).

Regarding claims 1 and 15, Fatehi discloses an apparatus and method for creating a communication signal, comprising a modulator adapted to: modulate a first and a second beam of continuous wave electromagnetic radiation with a source signal (fig. 7 and col. 5, line 59 to col. 6, line 34), assemble modulated portions of said first and second beams into a first electromagnetic radiation signal of interposed regular and alternate data bit sequences comprising asserted non return to zero coded data bits, each of said data bit sequences being interposed by unasserted data bits, in which mutually adjacent asserted data bits are conjoined (fig. 7 and fig. 8, element 56 and col. 5, line 59 to col. 6, line 15), and assemble modulated portions of said first and second beams into a second electromagnetic radiation signal of interposed regular and alternate data bar bit sequences comprising asserted non return to zero coded data bar bits representing said unasserted data bits, each of said data bar bit sequences being interposed by unasserted data bar bits representing said asserted data bits, in which mutually adjacent asserted data bar bits are conjoined (fig. 7 and fig. 8, element 58 and col. 5, line 59 to col. 6, line 15). Fatehi does not disclose modulating the first and second beams so

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that they combine to produce streams of asserted and unasserted data bits. Mizuhara discloses a Mach-Zehnder interference-based modulator configured to generate first and second modulated optical signals that are inverted versions of each other (fig. 3 and col. 4, lines 6-24). It would have been obvious to one of ordinary skill in the art at the time of the invention to use the Mach-Zehnder interference-based modulator as an engineering design choice in implementing a modulator with complementary outputs as already disclosed by Fatehi. The type of modulator claimed merely amounts to the selection of expedients known as design choices to one of ordinary skill in the art.

Regarding claims 3 and 17, the combination of Fatehi and Mizuhara discloses the apparatus and method of claims 1 and 15, in which said modulator is an external modulator that is adapted to modulate the relative phases of said first and second beams of continuous wave electromagnetic radiation with said source signal and to then subject said first and second beams of electromagnetic radiation to mutual interference (Mizuhara: fig. 3 and col. 4, lines 6-24, as applicable in the combination).

Regarding claim 4 and 18, the combination of Fatehi and Mizuhara discloses the apparatus and method of claims 1 and 15 comprising means adapted to decode said second electromagnetic radiation signal into a copy of said first electromagnetic radiation signal, by converting said unasserted data bar bits into asserted data bits and by converting said asserted data bar bits into unasserted data bits (Fatehi: fig. 7, element 72 and col. 5, lines 11-38).

Regarding claim 5, the combination of Fatehi and Mizuhara discloses the apparatus of claim 1 in which said modulator is adapted to modulate first and second beams of continuous wave light (Fatehi: fig. 7, elements, 50, 56 and 58 and col. 5, line 59 to col. 6, line 15).

Regarding claims 6 and 19, the combination of Fatehi and Mizuhara discloses the apparatus and method of claims 1 and 15 further comprising means for transmitting said first

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and second electromagnetic radiation signals to a single destination, providing protection for said source signal against a signal transmission failure (Fatehi: col. 6, lines 16-56).

Regarding claims 7 and 20, the combination of Fatehi and Mizuhara discloses the apparatus and method of claims 1 and 15 further comprising means for transmitting said first and second electromagnetic radiation signals to two destinations, bridging said source signal to said two destinations (Fatehi: fig. 7, elements 69 and 71 and col. 5, lines 11-38).

Regarding claim 8, the combination of Fatehi and Mizuhara discloses the apparatus of claim 1 further comprising: a transmitter for providing said source signal; a receiver; and an optical network having a first path and a second path, each of said paths being in communication with said transmitter and said receiver; said apparatus adapted to transmit said first electromagnetic radiation signal from said transmitter to said receiver on said first path and to transmit said second electromagnetic radiation signal from said transmitter to said receiver on said second path (Fatehi: fig. 7 and col. 5, line 59 to col. 6, line 34).

Regarding claim 9, the combination of Fatehi and Mizuhara discloses the apparatus of claim 1 further comprising: a transmitter for providing said source signal; first and second receivers; and an optical network having a first path and a second path, said first path being in communication with said transmitter and said first receiver, and said second path being in communication with said transmitter and said second receiver; said apparatus adapted to transmit said first electromagnetic radiation signal from said transmitter to said first receiver on said first path and to transmit said second electromagnetic radiation signal from said transmitter to said second receiver on said second path (Fatehi: fig. 7, elements 69 and 71 and col. 5, line 11 to col. 6, line 34).

Regarding claim 13, the combination of Fatehi and Mizuhara discloses the apparatus of claim 3 in which said external modulator comprises a dual output intensity modulator (Mizuhara: fig. 3 and col. 4, lines 6-24, as applicable in the combination).

Regarding claim 21, the combination of Fatehi and Mizuhara discloses the method of claim 15 in which each of said first electromagnetic radiation signal and said second electromagnetic radiation signal is an optical signal (Fatehi: fig. 7 and col. 5, line 59 to col. 6, line 15).

Regarding claim 25, the combination of Fatehi and Mizuhara discloses the method of claim 17 in which said step of modulating comprises controlling such mutual interference to selectively and simultaneously create said asserted data bits and said unasserted data bar bits (Mizuhara: fig. 3 and col. 4, lines 6-24, as applicable in the combination).

3. Claims 2, 10-12, 14, 16 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fatehi (US Patent No. 4878726) in view of Mizuhara (US Patent No. 6535316), as applied to claims 1, 3-9, 13, 15, 17-21 and 25 above, and further in view of Ono et al. ("Ono") (US Patent No. 6388786).

Regarding claims 2 and 16, the combination of Fatehi and Mizuhara discloses the apparatus and method of claims 1 and 15, and discloses that dispersion limits transmission distance (col. 2, lines 59-65), but does not disclose means for modulating said first electromagnetic radiation signal with a shift signal based on the source signal to shift the phase of said alternate data bit sequences and means for modulating said second electromagnetic radiation signal with said shift signal based on the source signal to shift the phase of said alternate data bar bit sequences. Ono discloses an optical modulation method that compensates for dispersion limitations by modulating an optical signal with a phase signal to

shift the phase of alternate data bit sequences of a signal (fig. 4 and col. 4, lines 34-42 and fig. 8 and col. 6, line 65 to col. 7, line 45). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combination of Fatehi and Mizuhara to include an alternating phase modulation of each of the regular and bar transmission signals, based on the teaching of Ono, to provide the benefit of compensating for dispersion.

Regarding claim 10, the combination of Fatehi, Mizuhara and Ono discloses the apparatus of claim 2 further comprising: a transmitter for providing said source signal; a receiver; and an optical network having a first path and a second path, each of said paths being in communication with said transmitter and said receiver; said apparatus adapted to transmit said first electromagnetic radiation signal from said transmitter to said receiver on said first path and to transmit said second electromagnetic radiation signal from said transmitter to said receiver on said second path (Fatehi: fig. 7 and col. 5, line 59 to col. 6, line 34).

Regarding claim 11, the combination of Fatehi, Mizuhara and Ono discloses the apparatus of claim 2 in which said means for modulating the first electromagnetic radiation signal with said shift signal based on the source signal to shift the phase of said alternate data bit sequences comprises a phase modulator (Ono: fig. 8, element 3, as applicable in the combination).

Regarding claim 12, the combination of Fatehi, Mizuhara and Ono discloses the apparatus of claim 2 comprising means adapted to simultaneously shift the phases of said alternate data bit sequences and of said alternate data bar bit sequences by modulation of said first and second electromagnetic radiation signals with said shift signal based on the source signal (Ono: fig. 8 and col. 6, line 65 to col. 7, line 45, as applicable in the combination).

Regarding claim 14, the combination of Fatehi, Mizuhara and Ono discloses the apparatus of claim 12 in which said means adapted to simultaneously shift the phases of said

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alternate data bit sequences and of said alternate data bar bit sequences comprises a toggle flip flop circuit (Ono: fig. 8, element 7 and fig. 9, as applicable in the combination).

Regarding claim 22, the combination of Fatehi, Mizuhara and Ono discloses the method of claim 16 in which said steps of modulating said first and second electromagnetic radiation signal with said shift signal based on the source signal comprise simultaneously shifting the phases of said alternate data bit sequences and said alternate data bar bit sequences (Ono: fig. 8 and col. 6, line 65 to col. 7, line 45, as applicable in the combination).

Regarding claim 23, the combination of Fatehi, Mizuhara and Ono discloses the method of claim 16 comprising the further step of transmitting said first and second electromagnetic radiation signals over a distance sufficient to generate chromatic dispersion resulting in some overlap between said data bit sequences and in some overlap between said data bar bit sequences, producing destructive interference (Fatehi: col. 2, lines 59-65).

Regarding claim 24, the combination of Fatehi, Mizuhara and Ono discloses the method of claim 16 in which said step of modulating said first and second electromagnetic radiation signals with said shift signal based on the source signal comprises shifting said phases by about 180.degree (Ono: col. 6, line 65 to col. 7, line 30).

### ***Response to Arguments***

4. Applicant's arguments filed 13 March 2007 have been fully considered but they are not persuasive.

The limitations added to claims 1 and 15 essentially amount to broader versions of the limitations added by dependent claims 3 and 17. The "first and second beams combine to produce streams of asserted and unasserted data bits" of claims 1 and 15 are a reflection of the first interferometer disclosed in applicant's fig. 7, specifically, the "combining" caused by the



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coupling at element 750; the combination of Mizuhara with Fatehi, previously reading on the "mutual interference" of claims 3 and 17, now also reads the "combining" added to claims 1 and 15, since these limitations are all directed to the same phenomena.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

6. Any inquiry concerning this communication from the examiner should be directed to N. Curs whose telephone number is (571) 272-3028. The examiner can normally be reached on M-F (from 9 AM to 5 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached at (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of

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a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (800) 786-9199.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://paired.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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